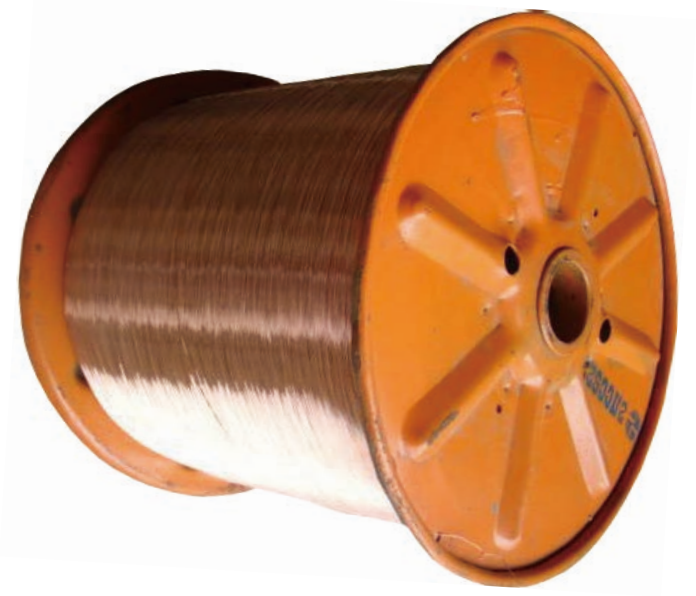
Copper clad steel wire CCS 18/21/30/40

RoHS



CROSS SECTION

APPLICATION

Copper-clad steel (CCS), also known as copper-covered steel wires from CommSun offers numerous value advantages, mainly used in the wire industry that combines the high mechanical resistance of steel with the conductivity and resistance to corrosion of copper, drop wire of telephone cables and inner conductor of coaxial cables, including thin hookup cables like RG174, CATV cable, etc.

SPECIAL FEATURES

Copper clad steel wire, also avalable in copper-plated steel wire CCS-16, copper steel wire conductivity 16% IACS.

RAW MATERIALS

Aluminum core materials	Steel or iron rod
Copper layer materials	Red copper strip or power, >99.90%

COMPARISON TYPICAL PHYSICAL PROPERTIES

Product Description	Density g/cm³	DC Conductivity %IACS 20°C (68°F)	Resistivity Ohm*mm²/m	Copper Volume	Copper weight	Tensile Strength (N/mm²)
CCS-18	7.89	18	0.0958	8.9%	10.1%	250-1900
CCS-21	7.99	21	0.0821	13.6%	15.2%	250-1900
CCS-30	8.02	30	0.0575	21.3%	23.6%	250-1900
CCS-40	8.15	40	0.0431	32.6%	35.6%	250-1900
Cu	8.89	100	0.0171	100%	100%	220-400
Steel	7.79-7.85	10.5-15.5	0.1277	0%	0	320-2500

1) CommSun have two kinds of metal wire according to processing technology, annealed flexible wire and hard drawn wire without annealing, annealed flexible wire have more nice elongation than hard drawn wire, but loss of the tensile strenth.
2) Stele wire have different density according to different tensile strength, so the conductivity also is different .
3) Copper clad steel wire also is avalable in high tensile strength.

TECHNICAL DATA CCS-21

PHYSICAL AND ELECTRICAL PROPERTIES OF COMMSUN CCS-21 WIRE

21% CONDUCTIVITY ANNEALED
(METRIC UNITS)

AWG	Diameter		Wire cross sectional area		Weight		Nominal copper thick	Maximum DC resistance	Min break load (kgf)
	inches	mm	inches²	mm²	kg/km	lbs/km	mm	Ω/km	Low carbon(LC)
11	0.0907	2.30	0.006461	4.1680	33.29	73.39	0.06911	0.06911	144
12	0.0808	2.05	0.005128	3.3081	26.42	58.24	0.06157	0.06157	114
13	0.0720	1.83	0.004072	2.6268	20.98	46.25	0.05486	0.05486	91
14	0.0641	1.63	0.003227	2.0820	16.63	36.66	0.04884	0.04884	72
15	0.0571	1.45	0.002561	1.6521	13.19	29.09	0.04351	0.04351	57
16	0.0508	1.29	0.002027	1.3076	10.44	23.02	0.03871	0.03871	45
17	0.0453	1.15	0.001612	1.0398	8.304	18.31	0.03452	0.03452	36
18	0.0403	1.02	0.001276	0.8229	6.572	14.49	0.03071	0.03071	28
19	0.0359	0.91	0.001012	0.6530	5.215	11.50	0.02736	0.02736	23
20	0.0320	0.81	0.000802	0.5189	4.144	9.135	0.02438	0.02438	18
21	0.0286	0.72	0.000644	0.4116	3.287	7.246	0.02172	0.02172	14
22	0.0253	0.64	0.000505	0.3243	2.590	5.710	0.01928	0.01928	11
23	0.0226	0.57	0.000400	0.2588	2.067	4.557	0.01722	0.01722	9
24	0.0201	0.51	0.000317	0.2047	1.635	3.605	0.01532	0.01532	7.1
25	0.0179	0.45	0.000252	0.1624	1.297	2.858	0.01364	0.01364	5.6
26	0.0159	0.40	0.000200	0.1288	1.028	2.267	0.01215	0.01215	4.4
27	0.0142	0.36	0.000158	0.1021	0.815	1.798	0.01082	0.01082	3.5
28	0.0126	0.32	0.000126	0.0810	0.647	1.426	0.00963	0.00963	2.8
29	0.0113	0.29	0.000100	0.0642	0.513	1.131	0.00858	0.00858	2.3
30	0.0100	0.25	0.000079	0.0509	0.407	0.897	0.00764	0.00764	1.7
31	0.0089	0.23	0.000063	0.0404	0.323	0.711	0.00680	0.00680	1.4
32	0.0080	0.20	0.000050	0.0320	0.256	0.564	0.00606	0.00606	1.1
33	0.0071	0.18	0.000039	0.0254	0.203	0.447	0.00539	0.00539	0.88
34	0.0063	0.16	0.000031	0.0201	0.161	0.355	0.00480	0.00480	0.69
35	0.0056	0.14	0.000025	0.0160	0.128	0.281	0.00428	0.00428	0.53
36	0.0050	0.13	0.000022	0.0127	0.101	0.223	0.00381	0.00381	0.46
37	0.0045	0.11	0.000016	0.0100	0.080	0.177	0.00339	0.00339	0.33
38	0.0040	0.10	0.000012	0.0080	0.064	0.140	0.00302	0.00302	0.27
39	0.0035	0.09	0.000010	0.0060	0.050	0.111	0.00269	0.00269	0.22

PHYSICAL AND ELECTRICAL PROPERTIES OF COMMSUN CCS-21 WIRE

21% CONDUCTIVITY HARD DRAWN
(METRIC UNITS)

AWG	Diameter		Wire cross sectional area		Weight		Nominal copper thick	Maximum DC resistance	Min break load (kgf)	
	inches	mm	inches²	mm²	kg/km	lbs/km	mm	Ω/km	Low carbon (LC)	Extra high strength (EHS)
11	0.0907	2.30	0.006461	4.1680	33.29	73.39	0.06911	0.06911	375	684
12	0.0808	2.05	0.005128	3.3081	26.42	58.24	0.06157	0.06157	262	393
13	0.0720	1.83	0.004072	2.6268	20.98	46.25	0.05486	0.05486	216	325
14	0.0641	1.63	0.003227	2.0820	16.63	36.66	0.04884	0.04884	181	268
15	0.0571	1.45	0.002561	1.6521	13.19	29.09	0.04351	0.04351	139	223
16	0.0508	1.29	0.002027	1.3076	10.44	23.02	0.03871	0.03871	114	185
17	0.0453	1.15	0.001612	1.0398	8.304	18.31	0.03452	0.03452	93	153
18	0.0403	1.02	0.001276	0.8229	6.572	14.49	0.03071	0.03071	78	127
19	0.0359	0.91	0.001012	0.6530	5.215	11.50	0.02736	0.02736	59	107
20	0.0320	0.81	0.000802	0.5189	4.144	9.135	0.02438	0.02438	49	80
21	0.0286	0.72	0.000644	0.4116	3.287	7.246	0.02172	0.02172	39	68
22	0.0253	0.64	0.000505	0.3243	2.590	5.710	0.01928	0.01928	31	58
23	0.0226	0.57	0.000400	0.2588	2.067	4.557	0.01722	0.01722	24	46
24	0.0201	0.51	0.000317	0.2047	1.635	3.605	0.01532	0.01532	20	38
25	0.0179	0.45	0.000252	0.1624	1.297	2.858	0.01364	0.01364	16	30
26	0.0159	0.40	0.000200	0.1288	1.028	2.267	0.01215	0.01215	13	23
27	0.0142	0.36	0.000158	0.1021	0.815	1.798	0.01082	0.01082	11	20
28	0.0126	0.32	0.000126	0.0810	0.647	1.426	0.00963	0.00963	9.1	16
29	0.0113	0.29	0.000100	0.0642	0.513	1.131	0.00858	0.00858	7.5	13
30	0.0100	0.25	0.000079	0.0509	0.407	0.897	0.00764	0.00764	6.1	10
31	0.0089	0.23	0.000063	0.0404	0.323	0.711	0.00680	0.00680	5.2	8.8
32	0.0080	0.20	0.000050	0.0320	0.256	0.564	0.00606	0.00606	4.1	6.7
33	0.0071	0.18	0.000039	0.0254	0.203	0.447	0.00539	0.00539	3.3	5.5
34	0.0063	0.16	0.000031	0.0201	0.161	0.355	0.00480	0.00480	2.6	4.6
35	0.0056	0.14	0.000025	0.0160	0.128	0.281	0.00428	0.00428	2.1	3.6
36	0.0050	0.13	0.000022	0.0127	0.101	0.223	0.00381	0.00381	1.7	3.1
37	0.0045	0.11	0.000016	0.0100	0.080	0.177	0.00339	0.00339	1.3	2.5
38	0.0040	0.10	0.000012	0.0080	0.064	0.140	0.00302	0.00302	1.0	38

TECHNICAL DATA CCS-30

PHYSICAL AND ELECTRICAL PROPERTIES OF COMMSUN CCS-30 WIRE

30% CONDUCTIVITY ANNEALED
(METRIC UNITS)

AWG	Diameter		Wire cross sectional area		Weight		Nominal copper thick	Maximum DC resistance	Min break load (kgf)	
	inches	mm	inches²	mm²	kg/km	lbs/km	mm	Ω/km	Low carbon (LC)	High strength (HS)
11	0.0907	2.30	0.006461	4.1680	33.97	74.89	0.1613	13.79	129	144
12	0.0808	2.05	0.005128	3.3081	26.96	59.43	0.1437	17.37	103	114
13	0.0720	1.83	0.004072	2.6268	21.41	47.19	0.1280	21.88	81	91
14	0.0641	1.63	0.003227	2.0820	16.97	37.40	0.1140	27.60	65	72
15	0.0571	1.45	0.002561	1.6521	13.46	29.68	0.1015	34.79	51	57
16	0.0508	1.29	0.002027	1.3076	10.66	23.49	0.0903	43.79	41	45
17	0.0453	1.15	0.001612	1.0398	8.473	18.68	0.0805	55.27	32	36
18	0.0403	1.02	0.001276	0.8229	6.706	14.78	0.0717	69.84	26	28
19	0.0359	0.91	0.001012	0.6530	5.322	11.73	0.0638	88.00	20	23
20	0.0320	0.81	0.000802	0.5189	4.228	9.322	0.0569	110.8	16	18
21	0.0286	0.72	0.000644	0.4116	3.354	7.394	0.0507	139.6	13	16
22	0.0253	0.64	0.000505	0.3243	2.264	5.827	0.0450	177.2	10	12
23	0.0226	0.57	0.000400	0.2588	2.109	4.650	0.0402	222.1	8	10
24	0.0201	0.51	0.000317	0.2047	1.668	3.678	0.0357	180.7	6	8
25	0.0179	0.45	0.000252	0.1624	1.323	2.917	0.0318	354.0	5	6
26	0.0159	0.40	0.000200	0.1288	1.049	2.313	0.0283	446.3	4	5
27	0.0142	0.36	0.000158	0.1021	0.832	1.835	0.0252	562.8	3	4
28	0.0126	0.32	0.000126	0.0810	0.660	1.455	0.0225	709.8	2.4	2.8
29	0.0113	0.29	0.000100	0.0642	0.523	1.154	0.0200	894.9	2.1	2.3
30	0.0100	0.25	0.000079	0.0509	0.415	0.915	0.0178	1,129	1.6	1.7
31	0.0089	0.23	0.000063	0.0404	0.329	0.726	0.0159	1,423	1.3	1.4
32	0.0080	0.20	0.000050	0.0320	0.261	0.575	0.0141	1,795	1.0	1.1
33	0.0071	0.18	0.000039	0.0254	0.207	0.456	0.0126	2,263	0.81	0.88
34	0.0063	0.16	0.000031	0.0201	0.164	0.362	0.0112	2,853	0.64	0.70
35	0.0056	0.14	0.000025	0.0160	0.130	0.287	0.0100	3,597	0.49	0.53
36	0.0050	0.13	0.000022	0.0127	0.103	0.228	0.0089	4,537	0.42	0.46
37	0.0045	0.11	0.000016	0.0100	0.082	0.181	0.0079	5,720	0.30	0.33
38	0.0040	0.10	0.000012	0.0080	0.065	0.143	0.0070	7,214	0.25	0.27
39	0.0035	0.09	0.000010	0.0060	0.051	0.113	0.0063	9,097	0.19	0.22

PHYSICAL AND ELECTRICAL PROPERTIES OF COMMSUN CCS-30 WIRE

30% CONDUCTIVITY HARD DRAWN
(METRIC UNITS)

AWG	Diameter		Wire cross sectional area		Weight		Nominal copper thick	Maximum DC resistance	Min break load (kgf)		
	inches	mm	inches²	mm²	kg/km	lbs/km	mm	Ω/km	Low carbon(LC)	High strength(HS)	Extra high strength(EHS)
11	0.0907	2.30	0.006461	4.1680	33.97	74.89	0.1613	13.79	312	442	514
12	0.0808	2.05	0.005128	3.3081	26.96	59.43	0.1437	17.37	256	274	408
13	0.0720	1.83	0.004072	2.6268	21.41	47.19	0.1280	21.88	185	230	324
14	0.0641	1.63	0.003227	2.0820	16.97	37.40	0.1140	27.60	142	182	257
15	0.0571	1.45	0.002561	1.6521	13.46	29.68	0.1015	34.79	116	145	204
16	0.0508	1.29	0.002027	1.3076	10.66	23.49	0.0903	43.79	95	114	161
17	0.0453	1.15	0.001612	1.0398	8.473	18.68	0.0805	55.27	78	91	128
18	0.0403	1.02	0.001276	0.8229	6.706	14.78	0.0717	69.84	64	74	102
19	0.0359	0.91	0.001012	0.6530	5.322	11.73	0.0638	88.00	49	59	81
20	0.0320	0.81	0.000802	0.5189	4.228	9.322	0.0569	110.8	40	48	64
21	0.0286	0.72	0.000644	0.4116	3.354	7.394	0.0507	139.6	32	36	58
22	0.0253	0.64	0.000505	0.3243	2.264	5.827	0.0450	177.2	25	28	55
23	0.0226	0.57	0.000400	0.2588	2.109	4.650	0.0402	222.1	21	23	45
24	0.0201	0.51	0.000317	0.2047	1.668	3.678	0.0357	180.7	17	18	36
25	0.0179	0.45	0.000252	0.1624	1.323	2.917	0.0318	354.0	13	15	28
26	0.0159	0.40	0.000200	0.1288	1.049	2.313	0.0283	446.3	11	12	22
27	0.0142	0.36	0.000158	0.1021	0.832	1.835	0.0252	562.8	9	10	18
28	0.0126	0.32	0.000126	0.0810	0.660	1.455	0.0225	709.8	7	8	14
29	0.0113	0.29	0.000100	0.0642	0.523	1.154	0.0200	894.9	6	7	12
30	0.0100	0.25	0.000079	0.0509	0.415	0.915	0.0178	1,129	5	6	9.5
31	0.0089	0.23	0.000063	0.0404	0.329	0.726	0.0159	1,423	4	5	8.0
32	0.0080	0.20	0.000050	0.0320	0.261	0.575	0.0141	1,795	3	4	5.8
33	0.0071	0.18	0.000039	0.0254	0.207	0.456	0.0126	2,263	2.6	3.1	4.9
34	0.0063	0.16	0.000031	0.0201	0.164	0.362	0.0112	2,853	2.0	2.8	4.0
35	0.0056	0.14	0.000025	0.0160	0.130	0.287	0.0100	3,597	1.6	2.2	3.0
36	0.0050	0.13	0.000022	0.0127	0.103	0.228	0.0089	4,537	1.4	1.9	2.7
37	0.0045	0.11	0.000016	0.0100	0.082	0.181	0.0079	5,720	1.0	1.4	1.9
38	0.0040	0.10	0.000012	0.0080	0.065	0.143	0.0070	7,214	0.88	1.0	1.6

TECHNICAL DATA CCS-40

PHYSICAL AND ELECTRICAL PROPERTIES OF COMMSUN CCS-40 WIRE

40% CONDUCTIVITY ANNEALED
(METRIC UNITS)

AWG	Diameter		Wire cross sectional area		Weight		Nominal copper thick	Maximum DC resistance	Min break load (kgf)	
	inches	mm	inches^2	mm^2	kg/km	lbs/km	mm	Ω/km	Low carbon (LC)	High strength (HS)
11	0.0907	2.30	0.006461	4.1680	34.33	75.68	0.2304	10.34	115	129
12	0.0808	2.05	0.005128	3.3081	27.24	60.06	0.2052	13.03	91	103
13	0.0720	1.83	0.004072	2.6268	21.63	47.69	0.1829	16.41	72	81
14	0.0641	1.63	0.003227	2.0820	17.14	37.80	0.1628	20.70	57	65
15	0.0571	1.45	0.002561	1.6521	13.60	29.99	0.1450	26.09	46	51
16	0.0508	1.29	0.002027	1.3076	10.77	23.74	0.1290	32.96	36	41
17	0.0453	1.15	0.001612	1.0398	8.563	18.88	0.1151	41.45	29	32
18	0.0403	1.02	0.001276	0.8229	6.777	14.94	0.1024	52.38	23	26
19	0.0359	0.91	0.001012	0.6530	5.378	11.86	0.0912	66.00	18	20
20	0.0320	0.81	0.000802	0.5189	4.273	9.420	0.0813	83.07	14	16
21	0.0286	0.72	0.000644	0.4116	3.389	7.472	0.0724	104.7	11	14
22	0.0253	0.64	0.000505	0.3243	2.671	5.888	0.0643	132.9	8.9	11
23	0.0226	0.57	0.000400	0.2588	2.131	4.699	0.0574	166.5	7.1	8.9
24	0.0201	0.51	0.000317	0.2047	1.686	3.717	0.0511	210.5	5.6	7.1
25	0.0179	0.45	0.000252	0.1624	1.337	2.948	0.0455	265.5	4.5	5.6
26	0.0159	0.40	0.000200	0.1288	1.060	2.338	0.0405	334.7	3.5	4.4
27	0.0142	0.36	0.000158	0.1021	0.841	1.854	0.0361	422.1	2.8	3.5
28	0.0126	0.32	0.000126	0.0810	0.667	1.470	0.0321	532.3	2.2	2.8
29	0.0113	0.29	0.000100	0.0642	0.529	1.166	0.0286	671.2	1.9	2.3
30	0.0100	0.25	0.000079	0.0509	0.419	0.925	0.0255	846.4	1.3	1.7
31	0.0089	0.23	0.000063	0.0404	0.333	0.733	0.0227	1,067	1.2	1.4
32	0.0080	0.20	0.000050	0.0320	0.264	0.581	0.0202	1,346	0.89	1.1
33	0.0071	0.18	0.000039	0.0254	0.209	0.461	0.0180	1,697	0.70	0.88
34	0.0063	0.16	0.000031	0.0201	0.166	0.366	0.0160	2,140	0.57	0.70
35	0.0056	0.14	0.000025	0.0160	0.132	0.290	0.0143	2,698	0.43	0.53
36	0.0050	0.13	0.000022	0.0127	0.104	0.230	0.0127	3,403	0.38	0.46
37	0.0045	0.11	0.000016	0.0100	0.083	0.182	0.0113	4,290	0.27	0.33
38	0.0040	0.10	0.000012	0.0080	0.066	0.145	0.0101	5,411	0.22	0.27
39	0.0035	0.09	0.000010	0.0060	0.052	0.115	0.0090	6,823	0.17	0.22

PHYSICAL AND ELECTRICAL PROPERTIES OF COMMSUN CCS-40 WIRE

40% CONDUCTIVITY HARD DRAWN
(METRIC UNITS)

AWG	Diameter		Wire cross sectional area		Weight		Nominal copper thick	Maximum DC resistance	Min break load (kgf)		
	inches	mm	inches^2	mm^2	kg/km	lbs/km	mm	Ω/km	Low carbon(LC)	High strength(HS)	Extra high strength(EHS)
11	0.0907	2.30	0.006461	4.1680	34.33	75.68	0.2304	10.34	302	402	456
12	0.0808	2.05	0.005128	3.3081	27.24	60.06	0.2052	13.03	201	273	385
13	0.0720	1.83	0.004072	2.6268	21.63	47.69	0.1829	16.41	164	225	289
14	0.0641	1.63	0.003227	2.0820	17.14	37.80	0.1628	20.70	135	186	243
15	0.0571	1.45	0.002561	1.6521	13.60	29.99	0.1450	26.09	103	136	192
16	0.0508	1.29	0.002027	1.3076	10.77	23.74	0.1290	32.96	85	112	158
17	0.0453	1.15	0.001612	1.0398	8.563	18.88	0.1151	41.45	71	93	133
18	0.0403	1.02	0.001276	0.8229	6.777	14.94	0.1024	52.38	59	77	105
19	0.0359	0.91	0.001012	0.6530	5.378	11.86	0.0912	66.00	44	60	89
20	0.0320	0.81	0.000802	0.5189	4.273	9.420	0.0813	83.07	37	50	67
21	0.0286	0.72	0.000644	0.4116	3.389	7.472	0.0724	104.7	29	40	57
22	0.0253	0.64	0.000505	0.3243	2.671	5.888	0.0643	132.9	23	31	49
23	0.0226	0.57	0.000400	0.2588	2.131	4.699	0.0574	166.5	19	25	39
24	0.0201	0.51	0.000317	0.2047	1.686	3.717	0.0511	210.5	15	21	33
25	0.0179	0.45	0.000252	0.1624	1.337	2.948	0.0455	265.5	12	16	25
26	0.0159	0.40	0.000200	0.1288	1.060	2.338	0.0405	334.7	10	13	19
27	0.0142	0.36	0.000158	0.1021	0.841	1.854	0.0361	422.1	8.1	10	17
28	0.0126	0.32	0.000126	0.0810	0.667	1.470	0.0321	532.3	6.5	8.1	13
29	0.0113	0.29	0.000100	0.0642	0.529	1.166	0.0286	671.2	5.1	6.8	11
30	0.0100	0.25	0.000079	0.0509	0.419	0.925	0.0255	846.4	3.9	5.0	8.5
31	0.0089	0.23	0.000063	0.0404	0.333	0.733	0.0227	1,067	3.4	4.3	7.2
32	0.0080	0.20	0.000050	0.0320	0.264	0.581	0.0202	1,346	2.6	3.2	5.5
33	0.0071	0.18	0.000039	0.0254	0.209	0.461	0.0180	1,697	2.1	2.6	4.6
34	0.0063	0.16	0.000031	0.0201	0.166	0.366	0.0160	2,140	1.7	2.1	3.7
35	0.0056	0.14	0.000025	0.0160	0.132	0.290	0.0143	2,698	1.3	1.6	2.8
36	0.0050	0.13	0.000022	0.0127	0.104	0.230	0.0127	3,403	1.2	1.4	2.5
37	0.0045	0.11	0.000016	0.0100	0.083	0.182	0.0113	4,290	0.85	0.99	1.8
38	0.0040	0.10	0.000012	0.0080	0.066	0.145	0.0101	5,411	0.71	0.83	1.5